

## WHAT IS CLAIMED IS:

*Sub B17* 1. A method for modifying the acoustic effect of an array of two or more speakers responsive to a plurality of audio input signals from one or more signal processors, wherein each of said speakers is comprised of one or more acoustic transducers, comprising:

5 providing one or more parameters derived from the physical relational characteristics of said speakers; and

using at least one of said parameters to modify said audio input signals.

2. The method of claim 1, wherein said physical relational characteristics include the distances between said two or more speakers.

3. The method of claim 1, wherein said two or more speakers are in the same enclosure.

4. An apparatus comprising:  
two or more speakers, each of said speakers comprised of one or more acoustic transducers;

5 a measuring device to determine one or more physical relational characteristic of said speakers;

an input circuit that provides one or more parameters derived from said physical relational characteristics of said speakers to said signal processors; and

10 at least one signal processor to apply acoustic processing to signals driving said plurality of acoustic transducers, wherein said acoustic processing is responsive to at least one of said parameters.

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an enclosure for said pair of speakers to hold them in a specified physical relation, wherein said enclosure provides data based on said specified physical relation as an output signal.

14. The speaker system of claim 13, wherein said specified physical relation is adjustable.

15. The speaker system of claim 14, wherein said speakers are essentially identical.

16. The speaker system of claim 15, wherein each of said speakers comprise a single acoustic transducer.

17. The speaker system of claim 15, wherein said specified physical relation comprises the distance between said speakers.

18. A method of processing audio signals for use in a plurality of speakers for the acoustic display of aural information, wherein some of the reproduced aural information appears to a listener to emanate from a virtual source which is spaced from the speakers, comprising:

5 receiving a plurality of audio signals;  
providing one or more input parameters, wherein at least one of said input parameters is derived from the relative physical characteristics of said plurality of speakers;

10 producing a plurality of enhanced output signals for use in said speakers, wherein said output signals are derived from said plurality of audio signals in response to said one or more input parameters.

19. The method of claim 18, wherein said relative physical characteristics include the relative position of said plurality speakers.

20. The method of claim 18, wherein said relative physical characteristics include the relative alignment of said plurality speakers.

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21. The method of claim 18, wherein said relative physical characteristics include the relative compliance of said plurality speakers.

22. The method of claim 18, wherein said plurality of speakers are contained within enclosures, and wherein said relative physical characteristics include the relative compliance of said enclosures.

23. A sound reproduction system comprising:  
 a first speaker array comprising:  
 a pair of essentially identical speakers each comprising a single acoustic transducer, wherein a first of said speakers is responsive to a first input signal and a second of said speakers is responsive to a second input signal; and  
 5 an enclosure for said pair of single driver speakers to hold them in a specified physical relation, wherein said enclosure provides data based on said specified physical relation as an output signal; and  
 a signal processor for providing said first and second input signals  
 10 comprising:  
 an audio input circuit to receive a plurality of audio signals;  
 a parameter circuit to receive one or more first input parameters, wherein at least one of said first input parameters is derived from said output signal provided by said first speaker array; and  
 15 an output circuit coupled to said parameter circuit to provide said input signals, wherein said input signals are derived by said output circuit from said plurality of audio signals in response to said one or more first input parameters.

24. The sound reproduction system of claim 23, wherein said specified physical relation is adjustable.



29. The sound reproduction system of claim 26, wherein said  
 5 relative physical characteristics include the relative position of said plurality  
 speakers.

30. The sound reproduction system of claim 29, wherein said first  
 speaker array further comprises:

a locator to provide data derived from the spatial relation of said first  
 speaker array; and

5 wherein said relative position of said plurality speakers is derived  
 from said data.

31. The sound reproduction system of claim 26, wherein said  
 relative physical characteristics include the relative alignment of said plurality  
 speakers.

32. The sound reproduction system of claim 26, wherein said  
 relative physical characteristics include the relative compliance of said plurality  
 speakers.

33. The sound reproduction system of claim 26, wherein said  
 plurality of speakers are contained within enclosures and wherein said relative  
 physical characteristics include the relative compliance of said enclosures.

34. The sound reproduction system of either of claims 25 or 29,  
 wherein said first speaker array is located in front of said listener, further comprising:  
 a plurality of rear speakers located to the rear of said listener, wherein  
 said rear speakers are responsive to one or more of a plurality of rear input signals;  
 5 a rear audio input circuit to receive said plurality of audio signals;  
 and

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a rear output circuit to provide said plurality of rear input signals, wherein said rear input signals are derived by said rear output circuit from said plurality of audio signals.

35. The sound reproduction system of either of claims 25 or 29, wherein said first speaker array is located in front of said listener, further comprising:

a rear speaker array comprising:

5 a plurality of rear speakers located to the rear of said listener, wherein said rear speakers are responsive to one or more of a plurality of rear input signals; and

a rear signal processor for providing said plurality of rear input signals comprising:

10 an rear audio input circuit to receive said plurality of audio signals; a rear parameter input circuit to receive one or more rear input parameters, wherein at least one of said rear input parameters is derived from the relative physical characteristics of said rear speaker array; and

15 a rear output circuit coupled to said rear parameter input circuit to provide said plurality of rear input signals, wherein said rear input signals are derived by said rear output circuit from said plurality of audio signals in response to said one or more rear input parameters.

36. The sound reproduction system of claim 35, wherein at least one of said first input parameters and said rear input parameters are derived from the relative position said rear speaker array with respect to said first speaker array.

37. The sound reproduction system of claim 35, wherein said front and rear signal processors are combined in a single circuit.

5 38. The sound reproduction system of claim 35, wherein said rear input signals are enhanced multichannel signals.



39. A sound reproduction system for providing the acoustic display of aural information to a listener, wherein some of the reproduced aural information appears to said listener to emanate from a virtual source which is spaced from the speakers, comprising:

5 a pair of front speakers placed in front of said listener, wherein a first of said front speakers is responsive to a first front input signal and a second of said front speakers is responsive to a second front input signal;

10 a pair of rear speakers placed to the rear of said listener, wherein a first of said rear speakers is responsive to a first rear input signal and a second of said rear speakers is responsive to a second rear input signal; and

at least one signal processor to supply said front and rear input signals, wherein said input signals are enhanced signals derived by said at least one signal processor from a plurality of audio signals in response to the relative physical characteristics of said speakers.

40. The sound reproduction system of claim 39, further comprising:

5 a pair of left speakers placed to the left of said listener, wherein a first of said left speakers is responsive to a first left input signal and a second of said left speakers is responsive to a second left input signal; and

a pair of right speakers placed to the right of said listener, wherein a first of said right speakers is responsive to a first right input signal and a second of said right speakers is responsive to a second right input signal; and

10 wherein said at least one signal processor additionally supplies said left and right input signals.

41. The sound reproduction system of either of claims 39 or 40, wherein said relative physical characteristics comprise the relative positions of said speakers.

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42. A method of processing audio signals for providing first and second output signals for use in a pair of essentially identical speakers for the acoustic display of aural information, the first of said speakers responsive to said first output signal and the second of said speakers responsive to said second output signals, comprising:

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receiving a plurality of audio signals;

providing one or more input parameters, wherein at least one of said input parameters is derived from the physical characteristics of said pair of speakers; and

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producing said output signals, wherein above a first frequency, said first and second output signals are independent, and in a range of frequencies below said first frequency, said first and second output signals are the same, and wherein said first frequency is derived by said output circuit from said plurality of audio signals in response to said one or more input parameters.

43. The method of claim 42, wherein said physical characteristics includes the size of said speakers.

44. The method of claim 42, wherein said output signals are enhanced signals.

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